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ABSTRACT OF THE DISCLOSURE

X-ray images such as radiotherapy portal images and simulation images are matched by apparatus which digitizes the images and automatically processes the digitized signals to generate matched digitized signals which can be displayed for comparison. The digitized images are first coarse aligned using a transform generated from seed points selected interactively from the two images or through detection and identification of x-ray opaque fiducials placed on the patient. A fine alignment is then performed by first selecting intersecting regions of the two images and enhancing those regions. Secondly, an updated transform is generated using robust motion flow in these regions at successive ascending levels of resolution. The updated transform is then used to align the images which are displayed for comparison. The updated transform can also be used to control the radiotherapy equipment.